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Anatomical variants of the recurrent branch of the median nerve: A Systematic Review and Meta-Analysis Protocol

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Data extraction.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202630055

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 16 March 2026 and was last updated on 16 March 2026.

INTRODUCTION

Review question / Objective What is the pooled global prevalence of anatomical variants of the recurrent (thenar motor) branch of the median nerve (RBMN) according to the Lanz classification system?

Secondary Objective: What are the specific surgical implications with rare, high risk variants.

Rationale The RBMN supplies critical motor function to the thenar muscles. Unanticipated anatomical variants place the nerve at high risk of injury during routine hand surgeries, such as carpal tunnel release. An updated and complete synthesis of these variations is required to establish accurate prevalence rates and delineate surgical safe zones to prevent postoperative morbidity.

Condition being studied Anatomical variations of the recurrent (thenar motor) branch of the median nerve (using Lanz classification) and their relevance to iatrogenic nerve injury during carpal tunnel release surgery.

METHODS

Search strategy Databases: PubMed, Embase, and Scopus.
Terms: "Median Nerve" OR "Recurrent Branch" OR "Thenar Motor Branch" AND "Anatomical Variation".

Participant or population Human subjects undergoing intraoperative observation, imaging and human cadaveric specimens. There are no restrictions on age, sex, or ethnicity.

Intervention Not applicable.

Comparator Not applicable.

Study designs to be included Original research including cadaveric dissection studies, intraoperative reports, imaging reports and case reports. Case reports specifically for qualitative narrative synthesis.

Eligibility criteria Inclusion: Reporting quantitative raw data on the origin, course, or branching pattern of the RBMN mapped to the Lanz Classification. Published between 2015 and 2025. Exclusion: Secondary evidence (reviews, meta-analyses), subjects with significant wrist trauma or previous carpal tunnel surgery. Animal studies and conference abstracts lacking full-text availability are excluded.

Information sources Electronic databases (PubMed, Embase, Scopus).

Main outcome(s) Pooled global prevalence (proportions) of RBMN anatomical variants according to the Lanz classification.

Additional outcome(s) Qualitative descriptions of rare anomalies with their specific surgical complications.

Data management Covidence software is used for screening and duplicate removal. Standardized spreadsheets will be used for data extraction.

Quality assessment / Risk of bias analysis Anatomical Quality Assurance (AQUA) tool.

Strategy of data synthesis A random-effects meta-analysis will be conducted to pool the proportional prevalence of each Lanz classification variant, reported with 95% Confidence Intervals (CIs). Heterogeneity will be quantified using the I^2 statistic and Cochran's Q test. Qualitative data from case reports will be synthesized narratively to highlight rare, high-risk etiologies.

Subgroup analysis Subgroup analyses will be performed to compare prevalence rates between cadaveric dissection studies and in vivo studies.

Sensitivity analysis Sensitivity analyses will be conducted by excluding studies determined to have a high risk of bias.

Language restriction English.

Country(ies) involved Australia.

Other relevant information None

Keywords Median Nerve; Recurrent Branch; Thenar Motor Branch; Anatomical Variation; Lanz Classification; Carpal Tunnel Release.

Dissemination plans Submission to a peer-reviewed clinical anatomy or hand surgery journal.

Contributions of each author

Author 1 - Anthony Raphael - Conceptualized the study, performed screening, completed data extraction, and drafted the protocol and manuscript.

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Author 2 - Jeremy Pham - Performed independent screening and assisted with data extraction and risk of bias assessment.

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Author 3 - Lakal Dissabandara - Supervised the study as the senior anatomist, provided methodological guidance, and will critically revise the manuscript.

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